

**Amendments to the Specification:**

Please amend the title of invention as follows.

OPTICAL PICKUP ~~DEVICE~~ APPARATUS FOR REPRODUCING AND/OR  
RECORDING INFORMATION ON AN OPTICAL INFORMATION RECORDING MEDIUM

Please amend the paragraph [0012] of the published specification as follows.

[0012] Because an optical pick-up apparatus of the present invention ~~device written in item 1~~ has, in an optical pick-up device by which the reproducing and/or recording of the information is conducted for the optical information recording medium by using the light flux projected from the light source whose wavelength is 200-700 nm, a light intensity distribution conversion element by which the light intensity of the projected light passing the outmost peripheral portion of the effective diameter changes the light flux which is incident from the light source, and whose light intensity distribution is about Gaussian distribution, to a desired light intensity distribution between 45-95% of the light intensity of the projected light passing the optical axis position, and an objective optical element by which the light flux projected from the light intensity distribution conversion element is converged on the information recording surface of the optical information recording medium, when the peripheral light amount of the light flux incident on the objective optical element, is increased by the light intensity distribution conversion element, in an optimum range, considering the side-lobe and spot diameter, the recording and/or reproducing of the information can be more securely conducted for the optical information recording medium.

Please amend the paragraph [0021] of the published specification as follows.

[0021] It is preferable that ~~As to an optical pick-up device written in item 2, in the invention written in item 1,~~ the light intensity distribution conversion element satisfies the following expression when the light intensity in the vicinity of the effective diameter outermost peripheral portion in an incident light is A, the light intensity at the optical axis position is B, the light intensity in the vicinity of effective diameter outermost peripheral portion in the projected light is C, and the light intensity at the optical axis position is D. Hereupon, the effective diameter outermost peripheral portion is defined as a diameter determined by a predetermined stop in the optical pick-up device.

Please amend the paragraph [0022] of the published specification as follows.

[0022] It is preferable that ~~Because an optical pick-up device written in item 3 has,~~ in the optical pick-up device by which the reproducing and/or recording of the information is conducted for the optical information recording medium by using the light flux projected from the light source whose wavelength is 200-700 nm, a light intensity distribution conversion element by which the light intensity of the projected light passing the effective diameter outermost peripheral portion changes the light flux whose light intensity distribution is about Gaussian distribution, which is incident from the light source, to a desired light intensity distribution between 45-95% of the light intensity of the projected light passing the optical axis position, and an objective optical

element by which the light flux projected from the light intensity distribution conversion element is light-converged on the information recording surface of the optical information recording medium, and on the optical function surface of the objective optical element, it is provided with an optical path difference grant ring-shaped zone structure, formed of the ring-shaped zone around the optical axis, and structured so that a predetermined optical path difference is given each other to the light flux passed each ring-shaped zone, when, by the light intensity distribution conversion element, the peripheral light amount of the light flux incident on the objective optical element is increased in an optimum range considering the side-robe and spot diameter, the recording and/or reproducing of the information can be more securely conducted for the optical information recording medium. Further, by the optical path difference grant ring-shaped zone structure, the chromatic aberration correction at the time of information recording and/or reproducing, spherical aberration correction when the optical information recording media whose protective layer thickness is different, are used, and the spherical aberration correction due to the refractive index change of the objective optical element by the temperature change, can be conducted.

Please amend the paragraph [0023] of the published specification as follows.

[0023] ~~In the optical pickup apparatus of item 1, it~~ It is preferable that the optical intensity converting element transforms a light intensity distribution having about Gaussian distribution of a light flux emitted by the light source into a desired light intensity distribution wherein a light intensity of an outgoing light passing through an outermost periphery of an effective aperture becomes 60%-80% of a light intensity of an outgoing light passing through an optical axis position. Therefore, the side-robe doesn't exceed 1.7% and it prevents the optical pickup

apparatus from recording information on a neighboring track at the time of information recording.

Please amend paragraph [0024] of the published specification as follows.

[0024] It is preferable that ~~As to an optical pick-up device written in item 4, in the invention written in item 3,~~ the light intensity distribution conversion element satisfies the following expression, when the light intensity in the vicinity of the effective diameter outermost peripheral portion in the incident light is A, the light intensity at the optical axis position is B, the light intensity in the vicinity of the effective diameter outermost peripheral portion in the projected light is C, and the light intensity at the optical axis position is D.

Please amend paragraph [0025] of the published specification as follows.

[0025] It is preferable that ~~As to the optical pick-up device written in item 5, in the invention written in item 3 or 4,~~ the optical path difference grant ring-shaped zone structure is at least one of the diffraction structure, phase structure, and multi-level.

Please amend paragraph [0026] of the published specification as follows.

[0026] It is preferable that ~~Because an optical pick-up device written in item 6 has,~~ in the optical pick-up device by which the reproducing and/or recording of the information is conducted for the optical information recording medium by using the light flux projected from the light source

whose wavelength is 200-700 nm, a light intensity distribution conversion element by which the light intensity of the projected light passing the effective diameter outermost peripheral portion changes the light flux whose light intensity distribution is about Gaussian distribution, which is incident from the light source, to a desired light intensity distribution between 45-95% of the light intensity of the projected light passing the optical axis position, and an objective optical element by which the light flux projected from the light intensity distribution conversion element is light-converged on the information recording surface of the optical information recording medium, and an objective optical element whose numerical aperture is not smaller than NA 0.65 by which the light flux projected from the light intensity distribution conversion element is light-converged on the information recording surface of the optical information recording medium, when, by the light intensity distribution conversion element, the peripheral light amount of the light flux incident on the objective optical element is made increased in an optimum range considering the side-lobe and spot diameter, the recording and/or reproducing of the information can be more securely conducted for the optical information recording medium. Further, when a NA not smaller than the numerical aperture NA 0.65 is attained, the high density recording and/or reproducing of the information can be conducted.

Please amend paragraph [0027] of the published specification as follows.

[0027] It is preferable that ~~As to an optical pick-up device written in item 7, in the invention written in item 6,~~ the light intensity distribution conversion element satisfies the following expression, when the light intensity in the vicinity of the effective diameter outermost peripheral portion in the incident light is A, the light intensity at the optical axis position is B, the light

intensity in the vicinity of the effective diameter outermost peripheral portion in the projected light is C, and the light intensity at the optical axis position is D.

Please amend paragraph [0028] of the published specification as follows.

[0028] It is preferable that ~~As to the optical pick-up device written in item 8, in the invention written in any one of items 1 to 7,~~ because a collimator element by which the finite light flux is incident and the infinite light flux is projected, is arranged between the light source and the light intensity distribution conversion element, a degree of freedom of the design work of the light intensity distribution conversion element is increased.

Please amend paragraph [0029] of the published specification as follows.

[0029] It is preferable that ~~As to the optical pick-up device written in item 9, in the invention written in items 1 to 7,~~ because the light intensity distribution conversion element is a component of a beam expander, the number of parts of the optical system is reduced.

Please amend paragraph [0030] of the published specification as follows.

[0030] It is preferable that ~~As to the optical pick-up device written in item 10, in the invention written in item 9,~~ because one of components of the beam expander is displaceable in the optical axis direction, and has a spherical aberration correction function, the recording and/or reproducing of the information can be more adequately conducted.

Please amend paragraph [0031] of the published specification as follows.

[0031] It is preferable that ~~As to the optical pick-up device written in item 11, in the invention written in item 9,~~ because one of components of the beam expander is fixed in the optical axis direction and has an optical path difference grant structure, the recording and/or reproducing of the information can be more adequately conducted.

Please amend paragraph [0032] of the published specification as follows.

[0032] It is preferable that ~~As to the optical pick-up device written in item 12, in the invention written in any one of items 9 to 11,~~ the beam expander is a Keplerian type. For example, because the Keplerian type beam expander uses 2 positive lenses as components, there is an advantage that each lens estimation is easy.

Please amend paragraph [0033] of the published specification as follows.

[0033] It is preferable that ~~As to the optical pick-up device written in item 13, in the invention written in any one of items 9 to 11,~~ the beam expander is a Galilean type. For example, in the Galilean type beam expander, by the lens composition of negative lens and positive lens, even when each lens power is small, because the space-saved arrangement becomes possible, it is advantageous for the size reduction of the optical pick-up device.

Please amend paragraph [0034] of the published specification as follows.

[0034] It is preferable that ~~As to the optical pick-up device written in item 14, in the invention written in any one of items 1 to 13,~~ because the light intensity distribution conversion element is a component of the beam shaper, the number of parts of the optical system is reduced.

Please amend paragraph [0035] of the published specification as follows.

[0035] It is preferable that ~~As to the optical pick-up device written in item 15, in the invention written in any one of items 1 to 14,~~ because the coma is corrected when the objective optical element is inclined to the optical axis, the recording and/or reproducing of the information can be more adequately conducted.

Please amend paragraph [0036] of the published specification as follows.

[0036] It is preferable that ~~As to the optical pick-up device written in item 16, in the invention written in any one of items 1 to 15,~~ because the chromatic aberration correction element is provided, the recording and/or reproducing of the information can be more adequately conducted.



Please amend paragraph [0037] of the published specification as follows.

[0037] It is preferable that ~~As to the optical pick-up device written in item 17, in the invention written in any one of items 1 to 16,~~ because the light intensity distribution conversion element is a separated body from the objective optical element, and because the light intensity distribution conversion element and objective optical element can be separately designed, a degree of freedom of the design work is increased.

Please amend paragraph [0038] of the published specification as follows.

[0038] It is preferable that ~~As to the optical pick-up device written in item 18, in the invention written in any one of items 1 to 17,~~ because, in the light intensity distribution conversion element, the light intensity ratio of the projected light flux to the incident light flux can be locally changed, for example, the arbitrary light intensity distribution adjusted for the characteristic of the light source can be obtained.

Please amend paragraph [0039] of the published specification as follows.

[0039] It is preferable that ~~As to the optical pick-up device written in item 19, in the invention written in any one of items 1 to 18,~~ because, by using the light fluxes projected from a plurality of light sources, the recording and/or reproducing of the information is conducted for different optical information recording media, the optical pick-up device whose added value is higher, can be provided.

Please amend paragraph [0040] of the published specification as follows.

[0040] It is preferable that ~~As to the optical pick-up device written in item 20, in the invention~~  
~~written in any one of items 1 to 19,~~ because the objective optical element is formed of a plastic as  
the raw material, it can be obtained in a large amount at low cost.

Please amend paragraph [0041] of the published specification as follows.

[0041] It is preferable that ~~As to the optical pick-up device written in item 21, in the invention~~  
~~written in any one of items 1 to 19,~~ because the objective optical element is formed of glass as  
the raw material, even when there is an environmental change, a stable performance can be  
provided.